```
/*
	GOPIKRISHNA V
	S3 CSE A
	52
	Menu Driven Doubly Linked List
*/
#include<stdio.h>
#include<stdlib.h>
struct node
{
	struct node *llink,*rlink;
	int data;
};
struct node *head=NULL,*ptr,*temp;
void display()
{
	ptr=head;
	if(ptr==NULL)
		printf("List Empty\n\n");
	else
	{
		printf("List >> [");
		while(ptr!=NULL)
		{
			printf("%d,",ptr->data);
			ptr=ptr->rlink;
		}
		printf("\b]\n");
	}
}
```

```
void insertF(int x)
{
	struct node *new;
	new=(struct node *)malloc(sizeof(struct node));
	new->data=x;
	new->llink=NULL;
	new->rlink=NULL;
	if(head==NULL)
		head=new;
	else
	{
		new->rlink=head;
		head->llink=new;
		head=new;
	}
	printf("%d --> INSERTED\n\n",x);
}
void insertE(int x)
{
	struct node *new;
	new=(struct node *)malloc(sizeof(struct node));
	new->data=x;
	new->llink=NULL;
	new->rlink=NULL;
	if(head==NULL)
		head=new;
	else
	{
		ptr=head;
		while(ptr->rlink!=NULL)
		{
```

```
                ptr=ptr->rlink;
            }
            ptr->rlink=new;
            new->llink=ptr;
        }
        printf("%d --> INSERTED\n\n",x);
}
void insertP(int x)
{
        int key;
        printf("Enter the Key (Element) = ");
        scanf("%d",&key);
        if(head==NULL)
            printf("List Empty\n");
        else
        {
            ptr=head;
            while(ptr->data != key && ptr->rlink != NULL)
                ptr=ptr->rlink;
            if(ptr->data != key)
                printf("Key Not Found - Insertion Not Possible\n");
            else
            {
                struct node *new;
                new=(struct node *)malloc(sizeof(struct node));
                new->data=x;
                new->llink=ptr;
                new->rlink=ptr->rlink;
                if(new->rlink !=NULL)
                    new->rlink->llink=new;
                ptr->rlink=new;
```

```
                printf("%d --> INSERTED\n\n",x);
            }
        }
}
void deleteF()
{
        if(head==NULL)
            printf("List Empty\n");
        else
        {
            if(head->rlink==NULL)
            {
                temp=head;
                head=NULL;
                printf("%d --> DELETED\n",temp->data);
                free(temp);
            }
            else
            {
                head=head->rlink;
                printf("%d --> DELETED\n",head->rlink->data);
                free(head->llink);
                head->llink=NULL;
            }
        }
}
void deleteE()
{
        if(head==NULL)
            printf("List Empty\n");
        else
```

```
	{
		if(head->rlink==NULL)
		{
			temp=head;
			head=NULL;
			printf("%d --> DELETED\n",temp->data);
			free(temp);
		}
		else
		{
			ptr=head;
			while(ptr->rlink!=NULL)
			{
				ptr=ptr->rlink;
			}
			ptr->llink->rlink=NULL;
			printf("%d --> DELETED\n",ptr->data);
			free(ptr);
		}
	}

}
void deleteP()
{
	int key;
	printf("Enter the Key (Element) = ");
	scanf("%d",&key);
	if(head==NULL)
		printf("List Empty\n");
	else
	{
```

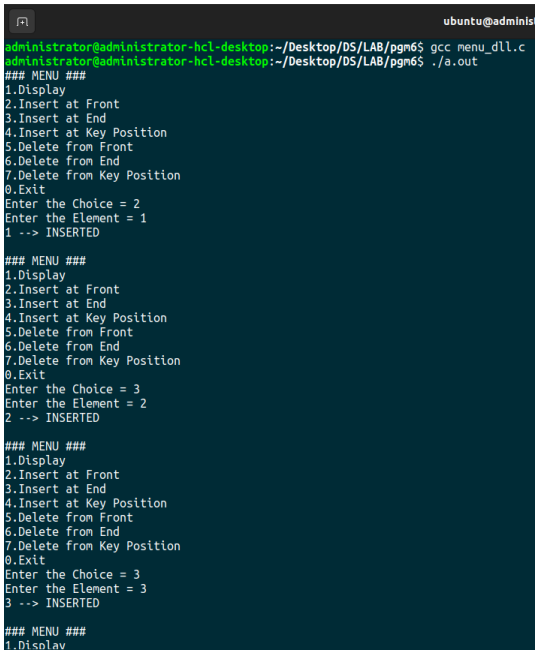
```
if(head->rlink==NULL)
{
	if(head->data==key)
	{
		temp=head;
		head=NULL;
		printf("%d --> DELETED\n",temp->data);
		free(temp);
	}
	else
	{
		printf("Key Not Found - Deletion Not Possible\n");
	}
}
else
{
	if(head->data=key)
	{
		head=head->rlink;
		printf("%d --> DELETED\n",head->llink->data);
		free(head->llink);
		head->llink=NULL;
	}
	else
	{
		ptr=head;
		while(ptr->data!=key && ptr->rlink!=NULL)
		{
			ptr=ptr->rlink;
		}
		if(ptr->data!=key)
```

```
                                        printf("Key Not Found - Deletion Not Possible\n");
                                else
                                {
                                        ptr->llink->rlink=ptr->rlink;
                                        if(ptr->rlink!=NULL)
                                        {
                                                ptr->rlink->llink=ptr->llink;
                                        }
                                        printf("%d --> DELETED\n",ptr->data);
                                        free(ptr);
                                }

                        }
                }
        }
}
int get()
{
        int x;
        printf("Enter the Element = ");
        scanf("%d",&x);
        return x;
}
void main()
{
        start:

        printf("### MENU ###\n");
        printf("1.Display\n");
        printf("2.Insert at Front\n");
        printf("3.Insert at End\n");
```

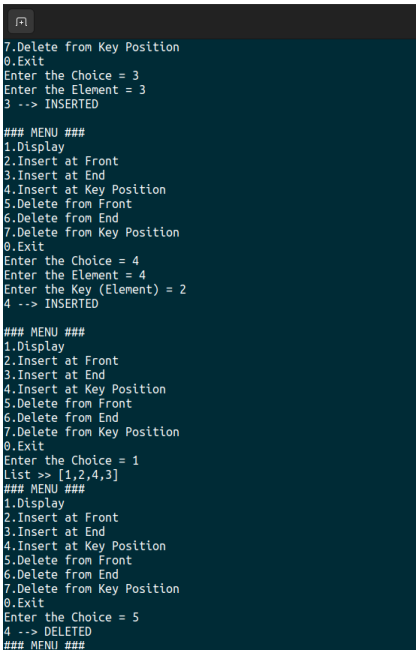
```
printf("4.Insert at Key Position\n");
printf("5.Delete from Front\n");
printf("6.Delete from End\n");
printf("7.Delete from Key Position\n");
printf("0.Exit\n");

int ch;
printf("Enter the Choice = ");
scanf("%d",&ch);

switch(ch)
{
        case 1:display();
                break;
        case 2:insertF(get());
                break;
        case 3:insertE(get());
                break;
        case 4:insertP(get());
                break;
        case 5:deleteF();
                break;
        case 6:deleteE();
                break;
        case 7:deleteP();
                break;
        case 0:exit(0);
                break;
        default:printf("Wrong Input\n");
}
```

```
        goto start;
}
```

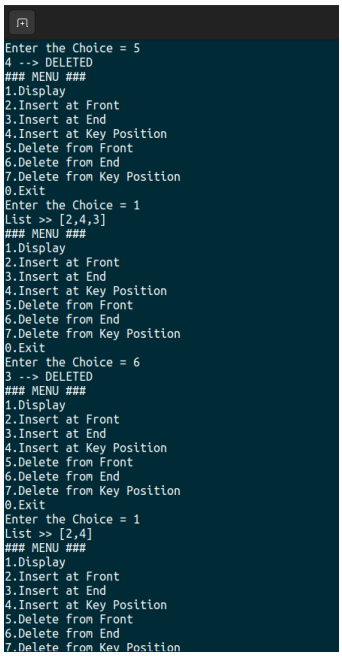
OUTPUT



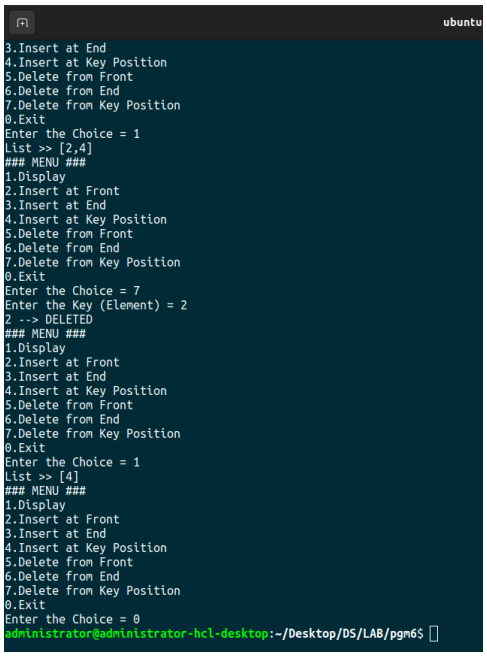
```
administrator@administrator-hcl-desktop:~/Desktop/DS/LAB/pgm6$ gcc menu_dll.c
administrator@administrator-hcl-desktop:~/Desktop/DS/LAB/pgm6$ ./a.out
### MENU ###
1.Display
2.Insert at Front
3.Insert at End
4.Insert at Key Position
5.Delete from Front
6.Delete from End
7.Delete from Key Position
0.Exit
Enter the Choice = 2
Enter the Element = 1
1 --> INSERTED

### MENU ###
1.Display
2.Insert at Front
3.Insert at End
4.Insert at Key Position
5.Delete from Front
6.Delete from End
7.Delete from Key Position
0.Exit
Enter the Choice = 3
Enter the Element = 2
2 --> INSERTED

### MENU ###
1.Display
2.Insert at Front
3.Insert at End
4.Insert at Key Position
5.Delete from Front
6.Delete from End
7.Delete from Key Position
0.Exit
Enter the Choice = 3
Enter the Element = 3
3 --> INSERTED

### MENU ###
```



```
7.Delete from Key Position
0.Exit
Enter the Choice = 3
Enter the Element = 3
3 --> INSERTED

### MENU ###
1.Display
2.Insert at Front
3.Insert at End
4.Insert at Key Position
5.Delete from Front
6.Delete from End
7.Delete from Key Position
0.Exit
Enter the Choice = 4
Enter the Element = 4
Enter the Key (Element) = 2
4 --> INSERTED

### MENU ###
1.Display
2.Insert at Front
3.Insert at End
4.Insert at Key Position
5.Delete from Front
6.Delete from End
7.Delete from Key Position
0.Exit
Enter the Choice = 1
List >> [1,2,4,3]
### MENU ###
1.Display
2.Insert at Front
3.Insert at End
4.Insert at Key Position
5.Delete from Front
6.Delete from End
7.Delete from Key Position
0.Exit
Enter the Choice = 5
4 --> DELETED
### MENU ###
```



```
Enter the Choice = 5
4 --> DELETED
### MENU ###
1.Display
2.Insert at Front
3.Insert at End
4.Insert at Key Position
5.Delete from Front
6.Delete from End
7.Delete from Key Position
0.Exit
Enter the Choice = 1
List >> [2,4,3]
### MENU ###
1.Display
2.Insert at Front
3.Insert at End
4.Insert at Key Position
5.Delete from Front
6.Delete from End
7.Delete from Key Position
0.Exit
Enter the Choice = 6
3 --> DELETED
### MENU ###
1.Display
2.Insert at Front
3.Insert at End
4.Insert at Key Position
5.Delete from Front
6.Delete from End
7.Delete from Key Position
0.Exit
Enter the Choice = 1
List >> [2,4]
### MENU ###
1.Display
2.Insert at Front
3.Insert at End
4.Insert at Key Position
5.Delete from Front
6.Delete from End
7.Delete from Key Position
```



```
3.Insert at End
4.Insert at Key Position
5.Delete from Front
6.Delete from End
7.Delete from Key Position
0.Exit
Enter the Choice = 1
List >> [2,4]
### MENU ###
1.Display
2.Insert at Front
3.Insert at End
4.Insert at Key Position
5.Delete from Front
6.Delete from End
7.Delete from Key Position
0.Exit
Enter the Choice = 7
Enter the Key (Element) = 2
2 --> DELETED
### MENU ###
1.Display
2.Insert at Front
3.Insert at End
4.Insert at Key Position
5.Delete from Front
6.Delete from End
7.Delete from Key Position
0.Exit
Enter the Choice = 1
List >> [4]
### MENU ###
1.Display
2.Insert at Front
3.Insert at End
4.Insert at Key Position
5.Delete from Front
6.Delete from End
7.Delete from Key Position
0.Exit
Enter the Choice = 0
administrator@administrator-hcl-desktop:~/Desktop/DS/LAB/pgm6$
```